Dam Failure

Profiling Hazard Event

Requirement §201.4(c)(2)(i): [The State risk assessment shall include an overview of the] location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate … .

Dam failures result from the failure of man made water impoundment structures, which often results from catastrophic down grade flooding. Dam failures are caused by one or a combination of the following: "breach from flooding or overtopping, ground shaking from earthquakes, settlement from liquefaction, slope failure, internal erosion from piping, failure of foundations and abutments, outlet leaks or failures, vegetation and rodents, poor construction, lack of maintenance and repair, misuse, improper operation, terrorism, or a combination of any of these" (Eldredge 46). The Utah State Engineer has been charged with regulating non-federal dams in the State, since 1919. "In the late 1970's Utah started its own Dam Safety Section within the State of Utah Engineers Office to administer all non-federal dams in response to the Federal Dam Safety Act (PL-92-367)" (Eldredge 46).

The State Dam Safety Section has developed a hazard rating system for all non-federal dams in Utah. Downstream uses, the size, height, volume, and incremental risk/damage assessments or dams are all variables used to assign dam hazard ratings in Dam Safety's classification system. Using the hazard ratings systems developed by the Dam Safety Section, dams are placed into one of three classifications high, moderate, and low. Dams receiving a low rating would have insignificant property loss do to dam failure. Moderate hazard dams would cause significant property loss in the event of a breach. High hazard dams would cause a possible loss of life in the event of a rupture. The frequency of dam inspection is designated based on hazard rating with the Division of Water Rights inspecting high-hazard dams annually, moderate hazard dams biannually, and low-hazard dams every five years. Currently, there are a total of 906 dams in Utah, and of those 906 dams, 236 have received a high hazard rating by Dam Safety.

Dam Name	County
ADAMS	Davis
ASH CREK	Washington
ANDERSON JUNCTION	Washington
BAKER	Washington
BIG EAST	Utah
BIG SAND WASH	Duchesne
BIG SAND WASH DAM	Duchesne
BIG SAND WASH EAST	Duchesne
BIG SAND WASH WEST	Duchesne
BIRCH CREEK NO. 2	Rich
BLACKSMITH UPPER DAM	Cache
BLUE CREEK	Box Elder
BOR ARTHUR V WATKINS	Box Elder
BOR CAUSEY	Weber
BOR COMBE EQUALIZING RESERVOIR	Weber
BOR CURRANT CREEK	Wasatch
Dam Name	**County**
BOR DEER CREEK	Wasatch
BOR EAST CANYON	Morgan
BOR ECHO	Summit
BOR FARMINGTON EQUALIZING RESERVOIR	Davis

BOR FLAMING GORGE	Daggett
BOR HUNTINGTON NORTH	Emery
BOR HYRUM	Cache
BOR JOES VALLEY	Emery
BOR JORDANELLE	Wasatch
BOR LOST CREEK (MORGAN)	Morgan
BOR LOST LAKE	Summit
BOR MOON LAKE	Duchesne
BOR NEWTON	Cache
BOR PINEVIEW	Weber
BOR RED FLEET	Uintah
BOR SCOFIELD	Carbon
BOR SOLDIER CREEK	Wasatch
BOR STARVATION	Duchesne
BOR STATELINE SUMMIT CO.	Summit
BOR STEINAKER	Uintah
BOR STILLWATER (UPPER)	Duchesne
BOR TRIAL LAKE	Summit
BOR WANSHIP	Summit
BOR WASHINGTON LAKE	Summit
BOTTLE HOLLOW	Uintah
BOUNTIFUL-NORTH CANYON(SDID#2)	Davis
BOUNTIFUL-OAKRIDGE (SDID #1)	Davis
BOX CREEK - LOWER (BEAVER CREEK)	Piute
BOX CREEK - UPPER (BEAVER CREEK)	Piute
BOX LAKE (PAYSON CITY)	Utah
BOYER LAKE	Summit
BROUGH	Uintah
BROWNS DRAW	Duchesne
BULLOCK DRAW	Uintah
CEDAR CITY - FIDDLER CANYON DB #2	Iron
CEDAR CITY DRY CANYON DB	Iron
CEDAR CITY STEPHENS CANYON DB NORTH	Iron
CEDAR CITY STEPHENS CANYON DB SOUTH	Iron
CENTER CREEK NO. 1	Wasatch
CENTER CREEK NO. 2	Wasatch
CENTER CREEK NO. 3	Wasatch
CENTERVILLE - BARNARD CREEK (UPPER) DB	Davis
CENTERVILLE CANYON DEBRIS BASIN	Davis
CHEPETA LAKE	Duchesne
CLEVELAND	Emery
CLIFF LAKE (DUCHESNE)	Duchesne
CORN CREEK	Millard
COTTONWOOD	Uintah
COTTONWOOD WASH DETENTION BASIN	Sevier
DAIRY CANYON DETENTION BASIN	Sevier
DAIRY DAM	Sanpete
DAVIS COUNTY - FARMINGTON POND	Davis
DAVIS COUNTY -BARTON CREEK DB	Davis
DAVIS COUNTY -HOLMES CREEK DB	Davis
DAVIS COUNTY -HOOPER DRAW DB	Davis
DAVIS COUNTY -MUTTON HOLLOW DB	Davis
DAVIS COUNTY -PARRISH CREEK DB	Davis
DAVIS COUNTY -RICKS CREEK DB	Davis
DAVIS COUNTY -SHEPARD CREEK DB	Davis
DAVIS COUNTY -STONE CREEK DB	Davis
DAVIS/WEBER COUNTY CANAL CO. KAYSVILLE	Davis
DAVIS/WEBER COUNTY CANAL CO. LAYTON POND	Davis
DAVIS/WEBER COUNTY CANAL CO. SUNSET POND	Davis
DEER VALLEY	Wasatch
DEER VALLEY SNOW MAKING RESERVOIR	Summit
DEUEL CREEK	Davis
DMAD	Millard
DRAPER PRESSURE IRRIGATION PROJECT	Salt Lake
DRY LAKE (PAYSON CITY)	Utah
DUTCH CANYON DAM - MIDWAY IRRIGATION	Wasatch
EAST PARK	Uintah
EAST TIMOTHY	Duchesne
ENSIGN DOWNS DB (AKA VICTORY ROAD DB)	Salt Lake
ENTERPRISE (LOWER)	Washington
ENTERPRISE (UPPER)	Washington
Dam Name	**County**
FAIRVIEW LAKE	Sanpete
FARMINGTON IRRIGATION - RESERVOIR B	Davis
FARMINGTON IRRIGATION - RESERVOIR C	Davis
FORSYTH	Sevier

GLENWOOD DEBRIS	Sevier
GRANTSVILLE	Tooele
GRASSY TRAIL	Carbon
GUNLOCK	Washington
GUNNISON	Sanpete
GUNNISON BEND	Millard
HAIGHT CREEK (LOWER)	Davis
HAIGHT CREEK (UPPER)	Davis
HIGHLAND CITY - NORTHWEST PRESSURE IRR.	Uintah
HOBBS	Davis
HOLMES	Davis
HUNTINGTON	Sanpete
IVINS BENCH	Washington
IVINS CITY DETETION BASIN	Washington
JACKSON FLAT RESERVOIR	Kane
JOHNSON	Sevier
JONES	Wasatch
KAYSVILLE	Davis
KENNECOTT MINE BINGHAM CREEK	Salt Lake
KENS LAKE	San Juan
KENT`S LAKE NO 1 (UPPER)	Beaver
KENT`S LAKE NO 2 (MIDDLE)	Beaver
KOLOB CREEK	Washington
KOOSHAREM	Sevier
LAKE MARY-PHOEBE	Salt Lake
LAPOINT	Unitah
LEIGH HILL RESERVOIR	Iron
LINDON CITY DRY CANYON DEBRIS BASIN	Utah
LINDON CITY IRRIGATION PROJECT ZONE II	Utah
LINDON CITY IRRIGATION PROJECT ZONE III	Utah
LINDSAY (BENNETT) LOWER	Wasatch
LITTLE DELL	Salt Lake
LITTLE VALLEY	Salt Lake
LOGAN CITY - DRY CANYON	Cache
LOGAN FIRST DAM	Cache
LONG PARK (DAGGETT)	Daggett
LOYD`S LAKE(MONTICELLO)	San Juan
M & S DAM	Unitah
MANDERFIELD (A.K.A. BEAVER)	Beaver
MANTUA	Box Elder
MAPLE LAKE	Uintah
MIDVIEW (LAKE BOREHAM)	Duchesne
MILL HOLLOW	Wasatch
MILL MEADOW	Wayne
MILLER FLAT	Emery
MILLSITE	Emery
MOAB CITY - TUSHER CANYON DETENTION	Grand
MOAB CITY - WALKER CANYON DB	Grand
MOAB CITY - WHITE CANYON RETENTION	Grand
MONA	Juab
MONTES CREEK	Unitah
MOUNTAIN DELL	Salt Lake
NEWCASTLE	Iron
NINEMILE	Sanpete
NORTH OGDEN CITY ORTON PARK/2100 NORTH	Weber
NORTH UTAH COUNTY - BATTLE CREEK	Utah
NORTH UTAH COUNTY - DRY CREEK	Utah
NORTH UTAH COUNTY - SILVER LAKE FLAT	Utah
NORTH UTAH COUNTY - TIBBLE FORK	Utah
NORTH UTAH COUNTY-GROVE CREEK DB	Utah
NORTHWEST	Morgan
OAK CREEK (A.K.A. UPPER BOWNS)	Garfield
OGDEN CITY - SULLIVAN HOLLOW	Weber
OQUIRRH LAKE DAM/KENNECOTT DAYBREAK	Salt Lake
OTTER CREEK	Piute
PALISADES LAKE	Sanpete
PANGUITCH LAKE	Garfield
PARADISE PARK	Uintah
PIUTE	Piute
POINT OF THE MOUNTAIN RAW WATER RES	Salt Lake
PORCUPINE	Cache
PROVO CITY - ROCK CANYON DB	Utah
PROVO CITY - SLATE CANYON DB NO. 2	Utah
Dam Name	**County**
PROVO CITY - SLATE CANYON DB NO. 3	Utah
QUAIL CREEK	Washington
QUAIL CREEK SOUTH DAM	Washington
RECAPTURE CREEK	San Juan
RED BUTTE DAM	Salt Lake
RED CREEK (DUCHESNE)	Duchesne

RED CREEK (IRON)	Iron
RED PINE	Salt Lake
RED WASH	Uintah
RIVERTON CITY - 3200 WEST POND	Salt Lake
RIVERTON CITY - 4200 WEST POND	Salt Lake
RIVERTON CITY - BLACK RIDGE RESERVOIR	Salt Lake
ROCK CANYON DAM (IRON)	Iron
ROCKY FORD (BEAVER)	Beaver
ROLFSON	Sanpete
SALT LAKE CO-CREEKSIDE PARK (BIG CTTNWD)	Salt Lake
SALT LAKE CO.-BIG COTTONWOOD (SPENCER`S)	Salt Lake
SALT LAKE COUNTY - SCOTT AVENUE	Salt Lake
SALT LAKE COUNTY - SUGARHOUSE	Salt Lake
SALT LAKE COUNTY CHANDLER DRIVE (#13)	Salt Lake
SALT LAKE COUNTY FEDERAL HEIGHTS (#1A)	Salt Lake
SALT LAKE COUNTY SCHOOL POND (#14)	Salt Lake
SALT LAKE COUNTY SHRINERS (#12)	Salt Lake
SALT LAKE COUNTY-ROTARY GLEN PARK	Salt Lake
SAND H DEBRIS	Sevier
SAND HOLLOW NORTH DAM	Washington
SAND HOLLOW WEST DAM	Washington
SANDY CITY - EAST SANDY ELEMENTARY	Salt Lake
SANDY CITY - FLAT IRON MESA	Salt Lake
SANDY CITY - STORM MOUNTAIN DB	Salt Lake
SANTA CLARA	Washington
SANTAQUIN PRESSURE IRRIGATION RESERVOIR	Utah
SARATOGA SPRINGS - ISRAEL CANYON	Utah
SEVIER BRIDGE	Juab
SLIDE CANYON DEBRIS BASIN	
SMITH AND MOREHOUSE	Summit
SOUTH CREEK - WASHINGTON COUNTY	Washington
SOUTH JORDAN RDA DB	Salt Lake
SOUTH OGDEN CITY BURCH CREEK (GLASMANN)	Weber
SOUTH OGDEN CITY BURCH CREEK DEBRIS	Weber
SPANISH FORK PRESSURE IRRIGATION POND	Utah
ST. GEORGE CITY - NAVAJO D.B.	Washington
ST. GEORGE CITY-CITY CREEK D.B.	Washington
STARVATION CANYON	San Juan
TEN ACRE LAKE	Weber
THREE CREEKS (BEAVER)	Beaver
THREE CREEKS (SEVIER)	Sevier
THREE MILE CREEK (PERRY CITY FCD) DB	Box Elder
TONY GROVE LAKE DAM	Cache
TROPIC	Garfield
TWIN LAKES (SALT LAKE)	Salt Lake
TWIN POTS	Duchesne
UTAH COUNTY SANTAQUIN DEBRIS	Utah
UTAH COUNTY THISTLE CREEK DEBRIS	Utah
UTAH COUNTY-HOBBLE CREEK DEBRIS BASIN	Utah
UTAH POWER & LIGHT - CUTLER	Box Elder
UTAH POWER & LIGHT - ELECTRIC LAKE	Emery
VALLEYVIEW #1(SDID#4 LOWER)	Davis
WARNER DRAW	Washington
WARNER VALLEY	Washington
WASATCH COUNTY LAKE CREEK DEBRIS BASIN	Wasatch
WAYNE HOLLEY	Utah
WHITE PINE	Salt Lake
WHITEROCKS LAKE	Unitah
WHITNEY	Summit
WIDE HOLLOW	Garfield
WILKINSON (HARRY)	Morgan
WINWARD (PETE)	Utah
WITT LAKE	Wasatch
WOODRUFF CREEK	Rich
YANKEE MEADOW	Iron

The rankings below were compiled as part of a hazard evaluation designed by the Federal Energy Regulatory Commission FERC. The dam rankings are assigned by a priority score with takes into account numerous variables some of which include: public access, population at risk, breach flow, inundation depth, and dam type. The listed ranking

shown in Figure I-3 only includes those 50 dams with the highest priority score. This figure lists only the top 50 as priority scores drop dramatically there after.

Figure I-3 – List of Fifty Dams with Highest Priority Score

1. Mountain Dell
2. Little Dell
3. Utah Power & Light Cutler
4. Quail Creek
5. Salt Lake County Sugarhouse
6. Logan First Dam
7. Quail Creek South Dam
8. Utah Power & Light Electric Lake
9. Porcupine
10. Red Butte Dam
11. Sevier Bridge
12. Panquitch Lake
13. Sand Hollow North Dam
14. Sand Hollow West Dam
15. North Utah County Tibble Fork
16. Adams
17. Twin Lakes Salt Lake County
18. Settlement Canyon
19. Utah County Thistle Creek Debris
20. DMAD
21. Gunnison Bend
22. Big Sand Wash
23. Kens Lake
24. Piute
25. Smith and Morehouse
26. Millsite
27. Sand H Debris
28. Hobbs
29. Lake Mary-Phoebe
30. Salt Lake County Big Cottonwood Spencer's
31. Haight Creek Lower
32. Provo City-Rock Canyon DB
33. Provo City- Slate Canyon BD No. 3
34. Holmes
35. Huntington
36. Kennecott Mine Bingham Creek
37. Three Creeks- Beaver
38. Davis County-Barton Creek DB
39. Gunlock
40. Lloyds Lake-Monticello
41. Forsyth
42. Blanding City No. 4
43. Utah County-American Fork Debris
44. Kaysville
45. Mill Meadow
46. Grantsville
47. Ash Creek
48. Gunnison
49. Davis County-Stone Creek DB
50. Tony Grove Lake Dam

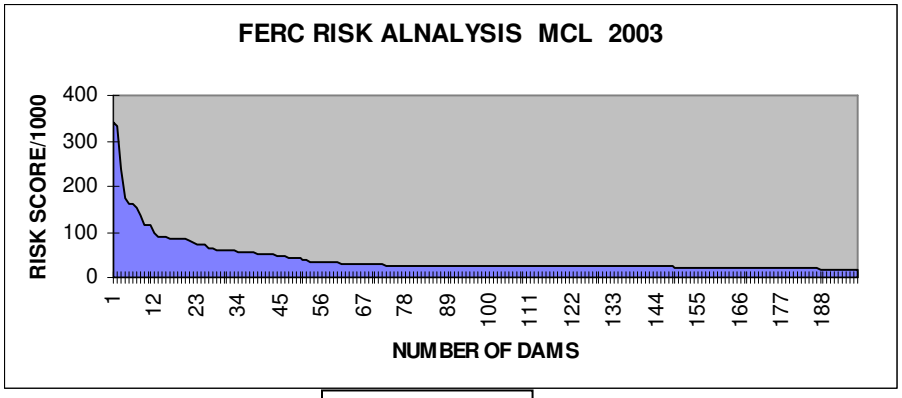

Figure I-5

Significant Dam Failure Events:

Quail Creek
Quail Creek dam failed on New Years Eve 1988 due to extensive foundation seepage. Failure caused approximately $12 million dollars in damage and cost approximately $8 million to rebuild. No lives were lost.

Trial Lake Dam Failure
Trial Lake Dam Failed in 1986 from piping of organics in the foundation contact. The BOR rebuilt the dam and the Corp repaired the damaged river channel

DMAD Dam Failure
DMAD Dam Failed in 1983 and a transient was killed trying to cross the flooding river on a suspended wire. The Gunnison Bend Dam was consequently breached proactively to keep it from overtopping.

Little Deer Creek
Little Deer Creek dam failed on its first filling on June 16, 1963, due to extensive foundation seepage. The catastrophic failure resulted in Utah's first dam failure fatality killing Bradley Galen Brown, a four-year-old boy.

Assessing Vulnerability by Jurisdiction

[Requirement §201.4(c)(2)(ii): [The State risk assessment shall include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the identified hazard areas shall also be addressed … .

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Dam-safety and dam construction, although improving, is still and imperfect subjective discipline. Many dams still fail each year in the United States. Society decided long ago the need to store water justified the risk association with storing the water. To assess vulnerability by jurisdiction the total number of dams, classified as having a high hazard rating, in each county were used to rank the jurisdictions vulnerability. Thus, a counties risk is purely a function of the number of high hazard dams in the county. Yet, one should keep in mind many factors, which can cause a dam to fail, and all dams can fail.

Table I-7 Number of Dams **with High Hazard Rating per County**

Salt Lake	29	Weber	8	Millard	3
Davis	27	Sanpete	7	Grand	3
Utah	22	Emery	6	Juab	2
Washington	18	Cache	6	Carbon	2
Uintah	15	Box Elder	5	Rich	2
Wasatch	14	Beaver	5	Daggett	2
Duchesne	14	San Juan	4	Tooele	1
Summit	10	Piute	4	Wayne	1
Iron	9	Garfield	4	Kane	1
Sevier	8	Morgan	4		
TOTAL	**236**				

Estimating Potential Losses by Jurisdiction

Requirement §201.4(c)(2)(iii): [The State risk assessment shall include an] overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Analyses of the total area per county that is susceptible to dam failure inundation were conducted. High hazard dams and dam inundation area shape files were provided by AGRC and federal dams and dam indentation area shape files were provided by the Bureau of Reclamation (BOR). The BOR and state dam failure inundation areas were clipped from each county in order to calculate the total area of potential loss per county. The BOR data provides various dam failure scenarios, such as sudden failure and sunny day failure. The highest potential inundation area was used for each listed BOR dam as to prevent overlapping and multiple summations of BOR dam inundation areas. Areas of potential loss due to dam failure inundation for each county were calculated using the "calculate geometry" function in ArcView 9.3

In addition, the percent total potential inundation areas per county were also calculated to demonstrate how much risk due to dam failure inundations exist in each county. This was calculated by dividing the total area of the county by the total potential dam failure inundation area of the county. Maps were then created that visualize this distribution of potential dam failure inundation risk areas per county, and that many of this areas border and intersect population cluster.

Table I-8 Total Potential Dam Failure Inundation by County

County	Total Potential Inundation Area by County (square miles)
Beaver	48.6
Box Elder	79.6
Cache	52.5
Carbon	11.5
Daggett	24.7
Davis	30.6
Duchesne	172.8
Emery	92.7
Garfield	23.9
Grand	17.6
Iron	184.2
Juab	17.9
Kane	0
Millard	560.1
Morgan	62.5
Piute	18.6
Rich	12.4
Salt Lake	49.5
San Juan	5.1
Sanpete	58.5
Sevier	80.9
Summit	44.5
Tooele	67.6
Uintah	488.6
Utah	134.0
Wasatch	34.6
Washington	67.2
Wayne	7.0
Weber	319.3
Total	2767

Table I-9 Total Potential Dam Failure Inundation by County

County	Percent Potential Inundation Area by County (square miles)
Beaver	1.9%
Box Elder	1.2%
Cache	4.5%
Carbon	.8%
Daggett	3.5%
Davis	4.8%
Duchesne	1.6%
Emery	2.1%
Garfield	.5%
Grand	.5%
Iron	5.6%
Juab	.5%
Kane	0%
Millard	8.2%
Morgan	10.3%
Piute	2.4%
Rich	1.1%
Salt Lake	6.1%
San Juan	.1%
Sanpete	3.7%
Sevier	4.2%
Summit	2.4%
Tooele	.9%
Uintah	10.8%
Utah	6.3%
Wasatch	2.9%
Washington	2.8%
Wayne	.3%
Weber	48.4%

The number of people per three arc-seconds within either a high hazard state or federal dam failure inundation area was calculated to help estimate the possible number of people that could be affected by dam failure inundation. Again, the dam data was provided by the AGRC and the BOR and the population density data was provided by LandScan. The Landscan data set was derived by the Oak Ridge National Laboratory utilizing a combination of information such as 2000 census data, proximity of population to roads, slopes, land cover, night-time lights, and other information that is then apportioned to each three second arc-second grid areas. An arc-second is a measure of latitude and longitude used by geographers that equates to approximately 90 meters by 70 meters in area. It is important to note that when working with population density data points, a 90m X 70m resolution is at a finer scale than census block data.

The "select by location" feature found in the ArcView 9.3 software package was used to determine how many people were located within a high hazard dam failure inundation area. LandScan provided estimated population location data for daytime and nighttime hours. In addition, areas that lie within both state and federal high hazard dam failure inundation areas were identified so that the populations within these overlapping areas were only counted once.

Table I-10 Total Daytime Population at Risk by County

County	Total Daytime Population within High Hazard Dam Failure Inundation Areas
Beaver	979
Box Elder	670
Cache	6724
Carbon	3630
Daggett	0
Davis	1462
Duchesne	35283
Emery	2372
Garfield	138
Grand	2921
Iron	8187
Juab	29
Kane	0
Millard	1534
Morgan	98
Piute	45
Rich	112
Salt Lake	112748
San Juan	11
Sanpete	1954
Sevier	8664
Summit	1430
Tooele	17631
Uintah	1432
Utah	95609
Wasatch	6085
Washington	14255
Wayne	27
Weber	5862

Table I-11 Total Night-time Population at Risk by County

County	Total Night-time Population within High Hazard Dam Failure Inundation Areas
Beaver	1045
Box Elder	1680
Cache	7780
Carbon	4094
Daggett	0
Davis	1462
Duchesne	34801
Emery	2783
Garfield	327
Grand	2516
Iron	10029
Juab	12
Kane	0
Millard	2873
Morgan	168
Piute	214
Rich	242
Salt Lake	100826
San Juan	20
Sanpete	1110
Sevier	9001
Summit	1937
Tooele	18472
Uintah	1145
Utah	92649
Wasatch	5151
Washington	15570
Wayne	76
Weber	3516

Assessing Vulnerability by State Facilities

Requirement §201.4(c)(2)(ii): [The State risk assessment shall include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the identified hazard areas shall also be addressed … .

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

State facilities data updated in November 2010 was provided by Utah's AGRC. The data presented in this shape file was complied with the help of several state agencies and state entities. The 2010 state facilities shape file was overlaid on top of the 2010 Utah state dam failure inundation areas map as well as the federal dam failure inundation locations. Using ArcView 9.3, each dam inundation area was clipped from a county shape files for each Utah county. The "select by location" option was then utilized in order to determine how many vulnerable structures exist per county.

Table I-12 Total Number of State Owned Facilities in Dam Failure Inundation Areas

County	Total Vulnerable Structures
Beaver	43
Box Elder	135
Cache	586
Carbon	135
Daggett	29
Davis	352
Duchesne	102
Emery	111
Garfield	75
Grand	79
Iron	230
Juab	73
Kane	71
Millard	85
Morgan	67
Piute	24
Rich	63
Salt Lake	2221
San Juan	104
Sanpete	189
Sevier	127
Summit	143

Tooele	94
Uintah	131
Utah	625
Wasatch	156
Washington	252
Wayne	36
Weber	398
Total	**6736**

Estimating Potential Losses by State Facilities

Requirement §201.4(c)(2)(iii): [The State risk assessment shall include an] overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.
Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Values estimating the potential losses by state-owned facilities were calculated by summing the current value of each state-owned facility per county that falls within the county's dam inundation areas. Current values of state facilities per county were provided by Risk Management. It is important to note that the current values represent the total value of the facilities that are located within a dam inundation area. These values assume that in the event of a dam breach, the state facilities within the dam inundation area would be completely destroyed rather than sustaining a particular amount of damage. Therefore, the current values overestimate the damage to state facilities in the event of most dam failures.

Table I-13 Total Value of State Owned Facilities in Dam Failure Inundation Area

County	Total Vulnerable Structures	Current Value
Beaver	43	$59,658,705
Box Elder	135	$384,071,542
Cache	586	$1,520,883,525
Carbon	135	$208,266,895
Daggett	29	$15,121,339
Davis	352	$1,473,229,390
Duchesne	102	$162,843,693
Emery	111	$111,498,739
Garfield	75	$56,085,456
Grand	79	$49,168,990
Iron	230	$542,074,952
Juab	73	$86,657,955
Kane	71	$59,766,836
Millard	85	$151,693,827
Morgan	67	$71,260,550
Piute	24	$17,118,968
Rich	63	$22,581,600

Salt Lake	2221	$9,243,977,141
San Juan	104	$155,374,819
Sanpete	189	$400,181,595
Sevier	127	$194,770,108
Summit	143	$286,656,757
Tooele	94	$325,264,444
Uintah	131	$232,447,687
Utah	625	$2,874,167,305
Wasatch	156	$178,608,368
Washington	252	$814,071,164
Wayne	36	$17,077,394
Weber	398	$1,595,063,587
Total	**6736**	**$21,309,643,331**